

WHAT IS CLAIMED IS:

- 1 1. A line interface for coupling a twisted pair telephone line with a
2 communications network, comprising:
 - 3 a broadband analog front end circuit coupling said twisted pair telephone line
4 with said line interface; and
 - 5 a programmable filter coupled to receive an output signal from said broadband
6 analog front end circuit and configured to filter frequency bands of said output signal into a
7 plurality of separate transmission channels, wherein said plurality of separate transmission
8 channels are associated with said communications network, and wherein said frequency
9 bands are determined by programming said programmable filter.
 - 1 2. The line interface of claim 1, wherein said communications network
2 comprises a data network and a voice network.
 - 1 3. The line interface of claim 1, further comprising:
 - 2 an analog to digital converter circuit, coupled between said broadband analog
3 front end circuit and said programmable filter, configured to convert said output signal to a
4 digital signal, wherein said programmable filter is a digital programmable filer.
 - 1 4. The line interface of claim 1, wherein said plurality of separate
2 transmission channels are directed to a plurality of different service providers.
 - 1 5. The line interface of claim 4, wherein said plurality of separate
2 transmission channels comprise a plurality of signals with a plurality of different modulation
3 schemes.
 - 1 6. The line interface of claim 1, wherein said programmable filter is
2 programmed with software.
 - 1 7. The line interface of claim 6, wherein said software is downloaded to
2 said programmable filter.
 - 1 8. The line interface of claim 1, wherein said plurality of separate
2 frequency bands are determined according to a protocol including at least one of POTS,
3 ISDN, ADSL, VDSL, SDSL, IDSL, HDSL, and HDSL2.

1 9. The line interface of claim 8, wherein said ADSL is one of full rate
2 ADSL, G.Lite, CAP, and QAM.

1 10. The line interface of claim 9, wherein said ADSL and said POTS
2 coexist on said twisted pair telephone line.

1 11. The line interface of claim 10, further comprising:
2 a POTS detector circuit coupled to provide a POTS usage signal to said
3 programmable filter indicating that a POTS bandwidth is in use.

1 12. The line interface of claim 11, wherein an ADSL bandwidth is
2 expanded to include said POTS bandwidth when said POTS usage signal indicates that said
3 POTS bandwidth is not in use, and said ADSL bandwidth is reduced to exclude said POTS
4 bandwidth when said POTS usage signal indicates that said POTS bandwidth is in use.

1 13. The line interface of claim 11, wherein said POTS detector circuit
2 detects whether a telephone connected to said twisted pair telephone wire is on hook or off
3 hook.

1 14. The line interface of claim 11, wherein said POTS detector circuit
2 determines if a POTS signal is communicated in said ADSL bandwidth or if said POTS
3 signal is communicated in said POTS bandwidth.

1 15. A method of providing a plurality of services over a twisted pair
2 telephone line, comprising the acts of:
3 receiving a broadband analog signal from said twisted pair telephone line;
4 filtering said broadband analog signal using a programmable filter into a
5 plurality of separate bands; and
6 transmitting said plurality of separate bands to a plurality of different service
7 providers.

1 16. The method of claim 15, wherein said separate bands are transmitted to
2 said plurality of different service providers through a data network and a voice network.

1 17. The method of claim 15, wherein said programmable filter is upgraded
2 by programming said filter with software.